Aadhaar Based Rural Development Schemes Retriveal and Eligibility Checking System

Markandeshwar Jerabandi[1]

[1]Dept. of CSE, R. T. E. Society's Rural Engineering College, Hulkoti, Gadag Karnataka, India-582205

mark.jerabandi@gmail.com

Abstract— **Aadhaar, which means 'foundation' is a 12-digit unique-identity number issued to all Indian residents based on their biometric and demographic data. The government has been working on linking bank details, Income Tax details, Communication means like telephone, SIM card and many other things to the AADHAAR number of an individual to centralize the details of an individual. The government has provided various number of schemes for the development of rural sector. The proposed method provides the details of schemes category-wise that an individual is eligible for by analyzing the data linked to his/her Aadhaar number in the Aadhaar database. The proposed method consists of four phases. In the first phase, the preferred language in selected by the user. Not everybody is comfortable with an interface having only standard languages so multi-lingual interface is provided. In the second phase the Aadhaar number is taken as input and is validated and verified. In the third phase, the eligible schemes for that user is retrieved from the database of schemes. In the fourth phase, the eligible schemes are organized category-wise and displayed to the user. The proposed method proposes a new way of retrieval or filtering of data using a distinct algorithm and data encoding technique. The method is found to be efficient and retrieves the data in less time.**

Keywords—Aadhaar; Rural Development; Retrieval; Eligibility Checking System;

I. INTRODUCTION

Aadhaar, which means 'foundation' is a 12-digit unique-identity number issued to all Indian residents based on their biometric and demographic data. The data is collected by the Unique Identification Authority of India (UIDAI), a statutory authority established in January 2009 by the Government of India. Aadhaar is the world's largest biometric ID system, with over 1.171 billion enrolled members as of 15 Aug 2017. As of this date, over 99% of Indians aged 18 and above had been enrolled in Aadhaar. World Bank Chief Economist Paul Romer described Aadhaar as "the most sophisticated ID programme in the world". The government has been working on linking bank details, Income Tax details, Communication means like telephone, SIM card and many other things to the AADHAAR number of an individual to centralize the details of an individual. The government has provided various number of schemes for the development of rural sector. Some of these schemes have to be applied through online portal and some have to be applied by directly going to the respective government offices. A large amount of the population is not aware of the schemes available for them. And also, if an individual requires even a slightest detail about a scheme, he/she has to go all the way to the respective office to enquire about it. This could be hectic for certain individuals. The awareness about the schemes available to particular individual would help the user gain knowledge about it and encourage that person to apply for that scheme. This will result in the development of the standards of the nation.

The government has been working on linking bank details, Income Tax details, Communication means like telephone, SIM card and many other things to the AADHAAR number of an individual to centralize the details of an individual. These details can be used for various purposes. The government of India has provided various number of schemes for the people of Rural Sector for their development. But the information about these schemes is not effectively reaching the people. The proposed method provides the details of schemes category-wise that an individual is eligible for by analyzing the data linked to his/her Aadhaar number in the Aadhaar database. The proposed method consists of four phases. In the first phase, the preferred language in selected by the user. Not everybody is comfortable with an interface having only standard languages so multi-

lingual interface is provided. In the second phase the Aadhaar number is taken as input and is validated and verified. In the third phase, the eligible schemes for that user is retrieved from the database of schemes. In the fourth phase, the eligible schemes are organized category-wise and displayed to the user.

The rest of the paper is organized in the following sections. The objectives for the work is discussed in section 2. The proposed methodology for Aadhaar Based Schemes Eligibility checking system is presented in section 3. Section 4 describes the algorithm used for filtering data with example. Section 5 includes results and its discussion. The concluding remarks and future scope is presented in section 6.

II.   OBJECTIVES OF THE WORK

The main goal of this work is to provide information about the schemes provided by the government that are eligible for that individual and by checking the eligibility criteria using Aadhaar details. A special efficient algorithm is designed using which the filtering of eligible schemes becomes easy and faster. The objective of this work is to implement a Web based service to check eligible schemes for an individual using the Aadhaar linked details. This work aims at providing details for the users at their finger-tips to avoid them going to the respective offices for every little detail. It helps the government to reach out to the people and provide information about the benefits provided for them. Keeping in mind that not all the people are familiar with work over digital means (especially people of rural locality), this idea aims at providing convenient service. This work also helps in digitalizing the nation and helps people at remote and urban places get the information that they need for their benefits.

III.   PROPOSED METHODOLOGY

The block diagram of the process of checking eligibility and displaying information of schemes is given in Fig. 3.1.

The detailed description of each processing module is presented in the following subsections.

First, the user enters his/her Aadhaar UID. Verification and Validation of Aadhaar number is done. The Aadhaar number of the user has to be entered and it is sent to the Aadhaar database where it is verified and validated and the information is retrieved using Aadhaar interface which should be provided by the government(UIDAI).

After the aadhaar number is verified, necessary information from other database such as caste, ration,

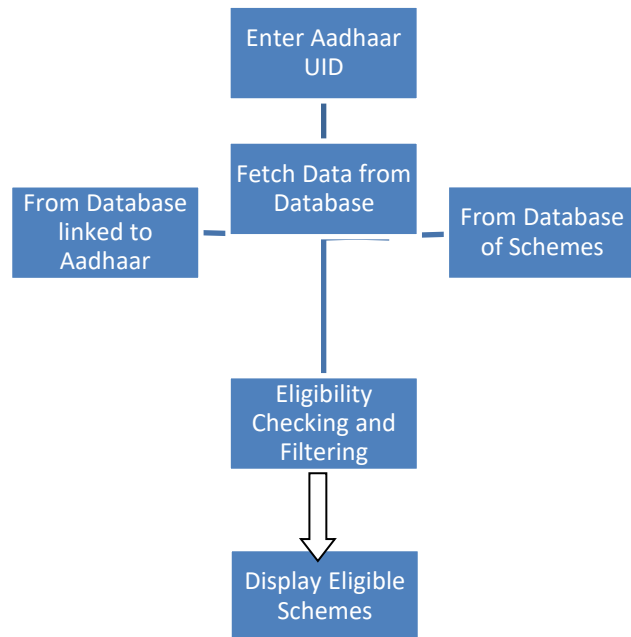income etc., is fetched and stored for checking the eligibility.

Fig. 3.1 Block Diagram of Eligibility and Information Display

The retrieved information about the user is cross referenced with database of schemes where the non-eligible schemes are filtered in every step based on the details related to the user.

Finally, the list of schemes the user is eligible for is displayed.

IV.   DATA ENCODING AND FILTERING ALGORITHM

This work consists of an our own designed algorithm which is used for filtering the schemes based on the eligibility criteria of the scheme and the available information of the user in the database. The algorithm aims at filtering the data efficiently and as quickly as possible. For this purpose, the algorithm doesn't directly use the information of the user but it uses the data that is got after encoding the user information. The data encoding helps easy filtering of data due to easy and efficient condition (eligibility) checking. The data encoding uses binary pattern. Data encoding of each row has different meaning. This section describes how the

data of different tables are encoded. Three rows of different tables are encoded.

1. "var_num" row of "aadhaar" database.

2. "caste" row of "caste" database.

3. "var_num" row of "schemes_list" database.

Data Encoding of "aadhaar" Table:

The "var_num" row of the "aadhaar" table is data encoded. This data is used to notify whether the information of ration card, income and caste related to this user is present in the database or not. The format of the encoded data and the meaning of respective code is given below.

Table 4.1 Encoded data format

Ration Card Details	Income Details	Caste Details
2^2	2^1	2^0
4	2	1

Table 4.2 Encoded data Table

Encoded Data	Ration Card Details Exists	Income Details Exists	Caste Details Exists
0	NO	NO	NO
1	NO	NO	YES
20	NO	YES	NO
21	NO	YES	YES
400	YES	NO	NO
420	YES	YES	NO
421	YES	YES	YES

Data Encoding of "caste" Table:

The "caste" row of the "caste" table is data encoded. This data is used to notify which caste does the user belong to. The format of the encoded data and the meaning of respective code is given below.

Table 4.3 Encoded data format

GM	SC	ST	OBC
2^3	2^2	2^1	2^0
8	4	2	1

Table 4.4 Encoded data Table

Encoded Data	GM	SC	ST	OBC
8000	YES	-	-	-
400	-	YES	-	-
20	-	-	YES	-
1	-	-	-	YES

Data Encoding of "schemes_list" Table:

The "caste" row of the "schemes_list" table data is encoded. This data is used to notify which caste which scheme is applicable to. The format of the encoded data and the meaning of respective code is given below.

Table 4.5 Encoded data format

GM	SC	ST	OBC
2^3	2^2	2^1	2^0
8	4	2	1

Table 4.6 Encoded data Table

Encoded Data	GM	SC	ST	OBC
8000	YES	-	-	-
400	-	YES	-	-

20	-	-	YES	-
1	-	-	-	YES
8420	YES	YES	YES	-
401	-	YES	-	YES
8001	YES	-	-	YES
421	-	YES	YES	YES
8021	YES	-	YES	YES
8400	YES	YES	-	-

A. Filtering Algorithm

The algorithm shown in Fig 4.1 aims at filtering the data efficiently and as quickly as possible. For this purpose, the algorithm doesn't directly use the information of the user but it uses the data that is got after encoding the user information.

The steps involved in filtering of data from the database are given below:

1. Fetch user details from the Aadhaar database.

2. Fetch the scheme details from the scheme database one at a time. If no schemes available, go to step 5.

3. Compare the var_num of user details with the var_num of scheme details. If same then continue or else go to step 1 and fetch details of next scheme.

4. Based on the var_num value, fetch the details of the Ration, Income and Caste of the respective aadhaar user if it is available in the database.

5. Compare this fetched data with the data in the schemes database to check the eligibility criteria.

6. If data matches, continue else go to step 1 and fetch details of next scheme.
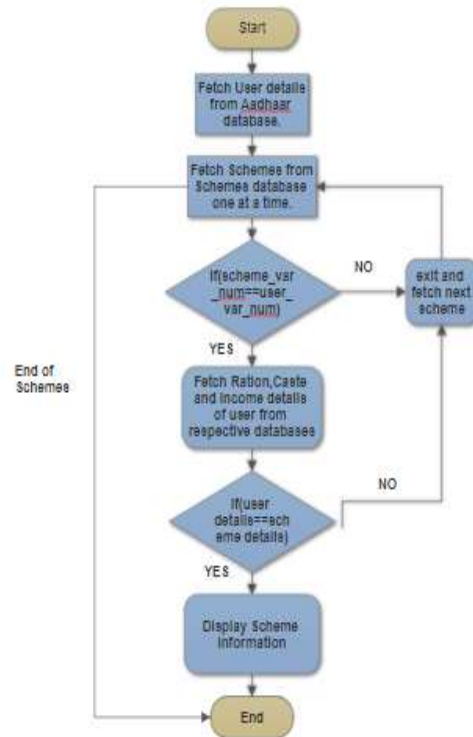
7. Display the scheme details.

Fig 4.1 Filtering Algorithm

B. An illustrative example of filtering algorithm

Let us see how the algorithm works for the user with the following UID.

UID: 234845858459

The details in the Aadhaar database regarding this user is as follows.

Table 4.7 User Aadhaar details

UID	234845858459
Name	Anand
Date of Birth	1996-07-06
Gender	Male
Pin- code	582103
City	Muddebihal
State	Karnataka
Mobile	8085432456
Var_Num	420

The following is the list of schemes in the database

Table 4.8 Scheme details

ID	Name	Card type	Caste	Income	Var_num
1	Rashtriya Swastiya Bima Yojana	APL	-	-	400
2	Universal Health Insurance Scheme	BPL	8000	180000	421
3	Aam Admi Bhima Yojana	-	-	-	0
4	Ganga Kalyana Scheme	-	1	-	1
5	Free Laptop Scheme	BPL	-	-	400
6	Karnataka Indira Vastra Bhagya Scheme	BPL	-	135000	420
7	Stand Up India	-	420	-	1
8	Pre-Matric and post-Matric Scholarship	BPL	-	200000	420
9	PETC	-	420	-	1
10	National Social Assistance Scheme	BPL	-	-	400

Now we need to compare the var_num of the user and the schemes. The var_num of the user is: 420

This condition is checked and the schemes which do not have var_num as 420 are eliminated.

The table after elimination is as follows

Table 4.9 Filtered Scheme Details which have var_num as 420

ID	Name	Card type	Caste	Income	Var_num
6	Karnataka Indira Vastra Bhagya Scheme	BPL	-	135000	420
8	Pre-Matric and post-Matric Scholarship	BPL	-	200000	420

According to the var_num, the Ration card type and Income has to be checked. The Ration card type of user is **BPL**. The income of user is user **1,00,000**.

Both the condition for eligibility is met i.e., the card type of user is same as that for scheme(BPL) and the income of user is less than that required by the scheme. Hence the user is eligible for both the schemes.

V.   CONCLUSION AND FUTURE SCOPE

In this work, an approach to provide Information and check Eligibility of an Individual for the various schemes provided by the Government in an efficient way using AADHAAR details is presented. This work has proposed a new way of retrieving or filtering data using a distinct algorithm and data encoding technique. This method helps in creating awareness in the people of rural sector about the schemes provided by the government. The proposed method can be further used by the Government to Analyse and Generate the reports based on various parameters as required by the Government. This would help the government to analyse what kind of schemes is required in which region.

Web References

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